Language-Wonder: Theory, Pedagogy, and Research

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"The tongue has the power of life and death..."

Hebrew Proverb[1]

Introduction: The Tongue Taken for Granted

We human beings are most likely to take for granted those things we use regularly or that surround us at all times. We become grateful for the air we breathe perhaps when a fresh draft blows through a stuffy room or when we leave the smoggy city for a holiday in the mountains, but otherwise, do not give it much thought. Many of us do the same with food, water, and other every-day essentials — including language. We may be amazed by language when we read great literature, or when we hear a baby utter his first words, but generally we take it for granted, overlooking it even as we use it.

However, upon closer investigation, we see that language is a phenomenon that cannot taken for granted. In fact, human language exhibits qualities that should secure it a place in the realm of wonder and awe. For that reason, this paper will attempt to demonstrate the wondrous aspects of language and then suggest how they might inform aspects of applied linguistics and language teaching. Specifically, this paper will discuss the following five main points:

1. Human language so radically differs from other species communicative behaviors that it appears to be a difference in kind — rather than degree.
2. The wonder of human language is rivaled only by one other representational

system — the biological language of DNA.

3. Similar to genetic processes, human intelligence through language enables humans innately to cross the abyss between the world of facts and experience and the realm of concepts and propositions.
4. Human intelligence and language capacity reveal representational powers and a host of other ethereal characteristics that demonstrate that mind and language cannot be perceived or based in a purely materialistic manner.
5. These wondrous aspects of language should have a substantial effect on the way teachers choose the methods, the content, and the *words* they use in the language classroom.
6. Language as wonder also suggests a potential research agenda in applied or psycholinguistics that heretofore has not been undertaken.

The Uniqueness of Human Language

One way to appreciate the wonder of human language is to compare it with the communication systems of other species. It may be popularly assumed that human language is developmentally a degree or a number of degrees more advanced than the communication systems of bees, birds, dolphins, whales, chimps, or gorillas, for example. However, the difference between the communication systems of other animals and humankind is large enough in degree — *that it may as well be a difference in kind.* According to Pinker (1994), nonhuman communication systems are based on one of three designs that differ greatly from human language (See 1–3 in Figure 1). Moreover, there are other important differences between human and nonhuman communication systems which Figure 1 outlines in numbers 4–5.

Regarding nonhuman communication systems, although there has been research done on dolphins and birds, for example, by far the most extensive and popular research has been done on primates. The topic was even the theme of a recent best selling novel and subsequent movie entitled "Congo" by Michael Crichton author of Jurrasic Park. An in depth overview of "primate linguistics" is not necessary here, but Oller and Omdahl (1994) summarize the problems with so-called primate language learning. Though some primates have demonstrated the capability to associate

hundreds of factual contexts in their surroundings with gestures, and the like, studies also clearly reveal that "there are several properties of the ordinary linguistic behavior of human children that no ape has ever been able to approximate" (261). In brief, the apes exhibited no grammar, no question formation, no language about language, and no abstract thought; they could only sign about the here and now. This means that the primates which were studied ***did not sign or understand a human "sign" language*** which according to Pinker (1994, 337) "is a full language with complex phonology, morphology, and syntax."

Moreover, this patronizing understanding of human sign language (that it is a system of crude pantomimes and unrefined gestures instead of the exquisitely complex language that it is) caused the researchers to misread their data and thus flawed their research. And there were many more problems. The apes jumbled their signs in hyper-repetition. They failed to take turns — but signed simultaneously with their partner, and many of their so-called sentences were direct imitations of their trainers. Thus, actually it seems that this intensively tutored ape communication is just that — an "aping of human communication," and this far short of the highly abstract and exquisitely complex ways humans use language. Thus, primate language is a far cry from human

Figure 1: Comparison of human and nonhuman communication

Nonhuman Communication	Human Communication
1. *A finite repertory of calls:* one for warning of predators, one for territorial claims, one for mating, etc.	1. *An infinite combinatorial system:* there is no limit to the number of potential sentences in a given language.
2. *A continuous analog signal:* the expression of the magnitude of some state, for example the livelier the bee dances the richer the food source.	2. *A digital system:* infinity is achieved through recombination of elements, not by varying a signal on a continuum — like turning up volume.
3. *A random variation on a theme:* birdsong repeated with different twists each time — but limited to territorial rights or mating, thus non-creative.	3. *A compositional system:* each truly unique combination differs in meaning based on the meanings of parts and the rules for their arrangement.
4. Time-bound and space-bound: nonhuman communication systems deal only with the here and now, with only minor exceptions.	4. *Displacement:* the ability to communicate about matters removed from time and space, including the unreal and infinite.
5. *Brain-stem control:* primate vocal calls are controlled by structures in the brain stem and limbic system — structures involved in emotion.	5. *Cerebral control:* human paralinguistic calls like sobbing and laughing are controlled subcortically, but real language is in the cerebral cortex.

language, and so the definition of "to ape" is appropriate: to mimic slavishly but often with an absurd result.

To call primate language a slavishly absurd imitation of human language is not to belittle it for what it is in and of itself. Ape communication is interesting for many reasons, e.g., because it shows humans can communicate with other primates, albeit in a rudimentary fashion. Additionally, it shows the relative intelligence of primates compared to lower animals as well as similarities between apes and humans. However, these similarities seem to be much less significant when compared with the *radical differences between human and primate linguistics* as shown in Figure 1. Moreover, although humans and chimpanzees share 98% to 99% of their DNA, it is important to note that "small genetic changes can have enormous effects on the final product" (Pinker, 351). The 1% difference could be big enough for the human language capacity, or it could mean that 1% of every gene is different — thus making 100% of the genes different. For example, changing one letter in every word of this paragraph could result in a text that is 100% different, not 10% or 20% different. As computer programmers know, a small change in one part of a program affects changes in many parts of the whole program resulting in an essentially different program in the end.

Besides, the radical differences between human and ape communication systems revealed in the primate studies, Figure 1 lists the basic differences between human language and all nonhuman communication systems. Basically, the differences between human and nonhuman communication systems can be summed up in the three so-called design features (Aitchison 1992, 13). They are: "creativity (the ability to produce novel utterances), displacement (the ability to refer to matters removed in space and time), and structure dependence (the presence of internal structure)." Moreover, along with these three features there is a continuity versus discontinuity dispute among researchers — those who argue that language developed continuously from earlier systems, and those who claim that human language developed separately. Obviously, I am arguing in favor of a kind of discontinuity; however, I am also attempting to point out aspects of language that the traditional discontinuity view cannot account for. To do this, having so far shown the basic uniqueness of human language, I will attempt to

explain that human language is a system so complex that it seems to be rivaled by only one other representational system: the language of DNA.

Human Language and Biological Language

The dictionary states that genetics is the "branch of biology that deals with heredity, especially the mechanisms of hereditary transmission," and that DNA is "a nucleic acid that carries the genetic information in the cell and is capable of self-replication." In these definitions, two words stand out: (1) ***transmission,*** and (2) ***information.*** That is, genetics deals with a transmission of information, a conveyance of meaning, or a form of biological communication; and thus, DNA is considered the fundamental building block of all living things — and has therefore been called *the code of life.*

John Oller (a linguist) and John Omdahl (a biochemist) have explored the relationship between human and biological language. To briefly sum up their work, Oller and Omdahl demonstrate that even with a single-celled organism, "the cascading network of representational processes that determine the shape of the organism is exceedingly delicate, articulate, and complex" (1994, 253), and that complexity is multiplied by many orders of magnitude in human development. Moreover, DNA, "consisting of highly organized linear arrays of delicately structured biological texts" must copy itself faithfully to every single cell of an organism, consisting of billions of cells. *This copying and translating of lengthy and highly organized biological texts is like the writer of this paper trying find the words and syntax to fit a particularly true and accurate interpretation of the actual ideas that are being represented here.* Oller and Omdahl go on to state that the representational functions of both biological and human language are "exactly analogous" (1994, 254). That is, the way we linguistically represent our human experience is seemingly identical to the way DNA genetically represents hereditary experience.

> Imagine what goes into producing or interpreting a particular statement, paragraph or text; the problem is like the true and appropriate fitting of a verbal description to a certain factual state of affairs in the world of experience. Like such articulate uses of language, the biological use of DNA is a consummately

articulate balancing act that involves the interrelationship of many factors simultaneously. The holistic balancing act defies the imagination. (254)

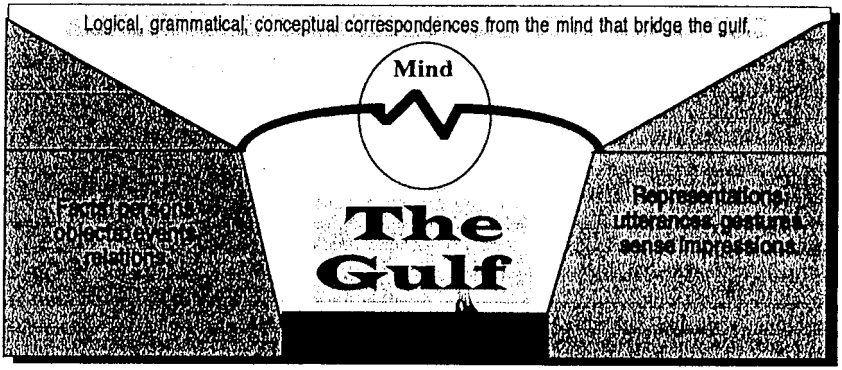
In addition, human and biological language are not only similar in this way; they are also related in that DNA determines — at least to some extent — the very existence of the human language capacity. That is, linguists generally agree on "the firm conclusion that there [is] biological evidence for innate language ability" (Aitchison 1989, 263), (but questions remain as to what aspects exactly are innate). Thus, basic innateness is not in question; otherwise, we might expect the family poodle to pick up French. Hence, it follows that the gulf between animal and human language is so immense that it is in effect communicatively and generatively infinite, and that leads us to our next topic — the abyss between facts and experience and the symbols we use to represent them.

The Abysmal Gulf

The uniqueness and extreme difference of degree (or virtual difference of kind) between human language and nonhuman communication is clearly revealed in that "apes are universally incapable of entering the realm of abstract thought" (Oller and Omdahl, 1994, 261). That is, they are unable to separate their communicative representations from the facts of experience; hence, their communicative ability does not move beyond the concrete — namely the here and now. It is stimulus-bound. However, humans are able to perform various sorts of abstract thought, for example, with reference to the past, the future, the hypothetical, the unreal, and the infinite. The mystery of the human ability to make the leap into abstract thought is depicted below in Figure 2. Oller and Omdahl (245) call this "Einsteins Gulf" because they attribute this concept to him.

We naturally take the ability to form abstract relations between mind and matter for granted, so it may not appear like such a wondrous process; however, upon closer examination, we find that this ability to think in the abstract represents a wondrous feat. To illustrate, we have an infinite number of arbitrary signs to which we can attach meaning. For example, Bad means Good, according to Michael Jackson, and

Figure 2: The gulf between facts and representations.



"rose" and "bara" mean the same thing in English and Japanese. Why do the words and sounds, expression and noises, phonemes and morphemes, the thingamabobs and whatchamacallits mean what they mean? As Shakespeare said:

Whats in a name? that which we call a rose
By any other name would still smell sweet.[2]

Therefore, we cannot simply gather meaning from the sign — or the sign from the meaning because there can be an infinite number of signs for the same meaning, or an infinite number of meanings can be appropriately symbolized by the same sign. Thus, there clearly is an abysmal gulf — which can be exemplified by a hypothetical two-window, linguistic slot machine. The left window will spin out an infinite number of meanings and the right window an endless number of signs, and by pulling the lever of chance there is virtually no possibility that the right meaning and sign will spin out as a matching pair in the windows. Hence, there cannot be a mechanically deterministic decision procedure for arriving at the meaning of the sign. That is, the ability to attach meanings to signs cannot simply be deduced from numbers, computation, and chance determinism. However, language and intelligence give us the ability to bridge this abyss, and hence, language points to a mind — a kind of intelligence that cannot simply be explained by a series of mechanically deterministic events.

Mind over Matter

Now at this point we have come to a deeply philosophical question, but one that also may have theoretical and practical bearing on us as linguists and language teachers. Are the mind and language merely a physical entities, like the advocates of strong artificial intelligence suggest — a computer made of meat (mind/brain) running a kind of Neuro-Fortran (language), or are the mind and language something more than this? Up to this point, I have briefly demonstrated the uniqueness, the complexity, and to some extent the wonder of language, but is there more?

The dictionary defines mind as: "the consciousness that originates in the brain and is manifested especially in thought, perception, emotion, will, memory, and imagination." Now the human mind is so amazing yet at the same time so common that we may need the gift of the poet to help us see the extraordinary in the ordinary.

From Wordsworth…

Not Chaos, not
The darkest pit of lowest Erebus,
Nor aught of blinder vacancy, scooped out
By help of dreams-can breed such fear and awe
As fall upon us often when we look
Into our Minds, into the Mind of Man.[3]

From Dickinson…

The Brain — is wider than the Sky —
For — put them side by side —
The one the other will contain
With ease — and you — beside.[4]

This mystery of the human mind has captivated the musings the greatest thinkers of all time, and hence numerous theories of the mind abound. The list is long. There are

monistic theories which attempt to reduce either mind or body to the other entity. Materialism, Identity Theory, and Idealism are three examples. There are also dualistic theories such as interactionism, occasionalism, parallelism, and epiphenomenalism. Nevertheless, in spite of the way these theories differ, a core issue surfaces. ***Mental and linguistic events apparently do not easily reduce to pure physicality.*** For example, to say that the mind is solely a physical entity (a computer made of meat), begs a contradiction. That is, by saying that the mind is solely a thing of matter, we remove the possibility of rational thought by not allowing for the essential aspects of rationality which are primarily non-material realities. Here Philosopher J. P. Moreland (96) sums this point up well, carefully using italics to emphasize the seemingly non-physical mental operations inherent in linguistically-based reasoning. That is, each italicized word in the following paragraph represent aspects of thought and language that cannot be reduced to physical entities or events without logical contradiction.

> it is self-refuting to argue that one ought to choose physicalism *because* he should *see* that the *evidence* is *good* for physicalism. Physicalism cannot be offered as a rational theory because physicalism does away with the necessary preconditions for there to be such a thing as rationality.

Therefore, as it seems clear that the non-physical events of the mind are indeed real, we are faced with the question of how the mind and its language could be grounded in physical matter. At this point we return to our comparison between human and biogenetic language.

The idea that the mind is a completely physical entity, assumes that it must emerge from mindless, non-rational matter. However, mental events cannot emerge from matter, for to do so would mean that these events must come from nothing — or as some have contended from some kind of mental potentiality in matter. However, first and most importantly, it is a generally accepted principle that *something cannot come from nothing.* Second, if the mind and language could come from some kind of mental potentiality in matter, then we are faced with the problem that matter is no longer describable in terms of familiar physical properties and laws alone. Now it contains

elusive mental properties (Moreland 1987, 101), and this question of even a hint of mental potentiality in matter is quite frustrating to a purely physicalistic explanation of the mind.

Moreover, the same can be said for biogenetic language. The genetic message in DNA distinguishes living things from non-living things. Non-living things have no genetic system, and living things have a genetic system. And it is impossible to transfer the genetic code from a non-living thing to a living thing. That is, exquisitely complex biogenetic life does not naturally emerge from matter. Most scientists may be uncomfortable with this; nonetheless, their disagreement is not necessarily scientific, but philosophical, relating to "metaclaims that take a vantage point outside science and have science itself as their subject of reference" (Moreland, 1994, 43). Thus, at this point, our discussion touches the important convergence of philosophy and science.

On the science side, Hubert Yockey (1992) and Michael Denton (1986), two renowned molecular biologists, and recently Michael Behe (1996) have rigorously demonstrated that strictly natural processes (or currently accepted theory) cannot explain the existence of living genetic systems. That is, life seems un-implicit in matter. At the risk of oversimplifying, and because of the importance of this point to my argument, I will briefly summarize their conclusions here and refer the reader to their works. First, Yockey suggests that the requisite information to begin life could not have self-generated by chance, and he argues that life be considered a given — like matter and energy. Denton concludes that Darwinian theory only has gathered empirical support at the microevolutionary level, and that regarding life's so-called prebiotic soup… there is absolutely no positive evidence for its existence (261).

Lastly, Behe discusses what he calls the "irreducible complexity" of cellular systems comparing them to, for example, a mouse trap saying that it cannot work until all the parts are in place. Likewise because of their startling complexity, Behe concludes that "Cells are simply too complex to have evolved randomly" (Behe, 1996b), and regarding such interactive systems, "we know of no other mechanism, including Darwin's, which produces such complexity" except intelligence. Although Yockey and Denton seem to not welcome the potentially theistic conclusion of Behe regarding intelligence, they along with Behe point to serious problems in our current accepted

understanding *of the basis and matter of life*. Hence, because of the cogency of the conclusions of these scholars, taken together with the growing force of serious reservations about some aspects of materialistic theory in the scientific community itself (for a summary, see Ankerberg and Weldon, 1994), we should give their findings serious consideration.

Specifically regarding the discussion of this paper, as demonstrated by Yockey, Denton, Behe, and others, matter itself does not seem to contain the ability to produce the highly articulate, and exquisite design of DNA. This is the same DNA — to the best of our knowledge — which contains the design for the innate aspects the human language capacity. Furthermore, in the same way that purely physical matter seems not to be able to produce DNA and the language capacity inherent in it, neither should we easily attribute physical causes to the non-physical realities of the human mind (including linguistic events). Hence, in short, I have tried to demonstrate the weighty and insistent problems with understanding biogenetic and human language in simply physicalistic terms. Moreover, it is therefore a reasonable hypothesis that the basis of the human mind and its language be understood in terms of wonder, awe, or the preternatural — if you will — in terms of transcendence — of categories that exist above and are independent of material experience.

The Wonder in the Applied Linguistics

Up to this point I have tried to demonstrate that there clearly is an abyss between the facts we experience and the signs we use to represent that experience. Moreover, I have also tried to show that strictly physical processes do not seem to account for the existence of the biogenetic code and human linguistic codes, nor can they easily account for the non-physical events or realities of the mind which are basic to linguistic competency. I have tried to show that the human mind is a literal wonder. Whatever conclusion my readers deduce from these theses, it seems safe to assume that at least most will concur that human language is a marvel of some kind. It is with these thoughts in mind that I now turn to how this wonder of language may inform applied linguistics and language teaching pedagogy.

Experience the Wonder

For some readers, the first section of this paper will seem too heavy on the theory side; however, there are numerous practical and potentially beneficial applications that may come from these abstract musings. These pragmatic issues relate to applied linguistic research, language teaching pedagogy, and even to world view issues such as spirituality and our view of the cosmos. I will list these practical themes here, and then develop them in the following section of this paper.

1. The wonder of language affects our view of language as a personal, social, and political force to be reckoned with, and this in turn affects our view of our relationship to and stewardship of human language as a distinctly human phenomenon.
2. Therefore, the wonder of language as an entity of force informs, raises, and cautions our view of language learners and users.
3. The wonder of language supports content-based approaches to language education that concur with the inherent wonder of language.
4. The wonder of language reinvigorates the teaching of language as content (linguistics in the language classroom) along with current trends toward content-based approaches.
5. The theory of the wonder of language can inform linguists in forging research questions and agendas that can test the empirical validity of such a theory.
6. The wonder of language informs the spiritual aspects of human existence and may also point to evidences for intelligent design in the natural realm.

The Wonder of Language and its Force

Regarding the force of language, Steven Pinker states: "A common language connects the members of a community into an information-sharing network with formidable collective powers. Anyone can benefit from the strokes of genius, lucky accidents, and trial and error wisdom accumulated by anyone else, present or past." (1994, 16). However, as Poulshock (1997) and many others have pointed out, the formidable force of language is a double-edged sword. After all, language may contain

information for construction or destruction — for medicine or missiles. These are serious considerations for language teachers, especially teachers of the worlds Lingua Franca: English, because they could be equipping their students with the linguistic ability with which to make weapons of mass destruction or to find the cure of the Aids virus. The point is simple: language is power. Moreover, this raises the issue of the moral responsibility of our playing with language, and thus suggests the need for further research into the awful and awesome force of language, its moral implications, and the consideration of the need to combine language and virtue education.

The Wonder and our View of Language Learners

As we look at language as a phenomenon of wonder — a powerful force — then we also look at language learners in a different light. Although Pinker (and the majority of linguists) may admit the uniqueness of human language, the result of their conclusion is often still "So what? Its unique because its our genetic niche in nature — just like the spiders niche is to spin its web." However, the wonder-view says something else: human language points to something preternatural and spiritual in humans that does not exist in other creatures. This does not diminish the value of other creatures (thats another question). It does, however, raise humans to a particular eminence in the cosmos. To have any other view would be nonsense — unfortunately it is a common and popular nonsense — *like not knowing what to save in the event of a house fire: your child or your hamster.*

Thus, the wonder of language also emphasizes the wonder of the learner, and it calls for proper and sober respect of the human being who learns and uses language and who possesses a kind of godlike and eternal glory — again radically different from any other creature. C.S. Lewis (1949, 39) in his famous essay "The Weight of Glory" discusses this same view of personhood in the following well-penned lines:

> It is in the light of these overwhelming possibilities, it is with the awe and the circumspection proper to them, that we should conduct all our dealings with one another, all friendships, all loves, all politics. There are no *ordinary* people. You have never talked to a mere mortal. Nations, cultures, arts, civilisations — these are mortal, and their life to ours as the life of a gnat. But it is with immortals

whom we joke with, work with, marry, snub, and exploit… This does not mean we are to be perpetually solemn. We must play. But our merriment must be of that kind (and it is, in fact, the merriest kind) which exists between people who have, from the outset, taken each other seriously — no flippancy, no superiority, not presumption.

Moreover, if people are wondrous and if language is a wonder, then it is as if our tongues handle a sword — a laser beam, the very power of life or death. If language is indeed an astounding, dynamic, and cosmic wonder under our imperfect control, then we must speak with prudence, compassion, love, and wisdom. If our words can indeed crucify or vivify, then we must use caution, forethought, humility, respect, and charity in our use of language in life and in the language classroom. Thus, in most pragmatic terms, the wondrous aspect of language lends support to the importance and the appropriate management of the affective realm in the language classroom. If language and people who produce it are both wonders, then there are no ordinary words or people in our classes, and hence, the words and especially the people with whom we use words are worthy of respect.

The Wonder and the Content in the Language Classroom

If indeed we are wielding a wonder in the language classroom, then it would seem diabolical if our lessons did not contain at least some of that wonder and intentness in them. There are many reasons why a language lesson may lack wonder: poor teaching, poor materials, fatigue, waning enthusiasm, and an emphasis on form without meaning. Because of these issues and others, many educators now advocate bringing deeper meaning (or wonder) into language classes through content-based education. Through enhancing the significance of language classes with content-based instruction — with a focus on meaning and meaningfulness — we may be able to experience a little more of the power and wonder of language in our classes. In other words, even though language is inherently wondrous, by ineptly focusing on form over meaning, or by focusing on form in a meaningless way, the wonder may be lost. Thus, one way to recover this wonder is to study language supercharged with meaning, through significant content.

The aim of this paper is not to give a defense of content-based instruction (CBI). That has already been done. In short, it may suffice to quote eminent grammarian and applied linguist Marianne Celce-Murcia who has said: “content-based language teaching has strong theoretical and empirical foundations that I believe will soon help make it the dominant approach to teaching ESL at all levels” (14, 1989). Nevertheless, I would like to suggest that the wonder of language lends even greater theoretical support to content-based language education in that CBI concurs and integrates well with the wondrous aspects of language as discussed in this paper.

Lastly, along with using general content-based instruction to recover or increase the wonder-factor in class, teachers may also need to give students specific instruction about the wondrous nature of language as one aspect of their content-based approach. Indirectly, students may catch some of the wonder if the teacher has understood and can express that wonder. Directly, teachers may give students a simple summary of the type of content mentioned in the first part of this paper. In addition, we may want to relate to our students the many ways in which words have changed the course of history, shaped the way we think, or even the way words influence us today to buy certain products or vote in a particular way. Perhaps our students would benefit simply from knowing more about the great wordsmiths of the English language such as Shakespeare, Lewis Carol, Emily Dickinson, etc. Possibly students could benefit from a weekly quote relating to the wonder of language, such as Wittgensteins “Language is a part of our organism and no less complicated than it.”[5] In short, teachers can do a great deal of brainstorming about how to increase “language-wonder” in class. Two good places to get some ideas for this are Richard Lederers little book *The Miracle of Language* (1991) and Bill Brysons *The Mother Tongue* (1990).

The Wonder and Language as Content

Besides the fact that content-based language education is theoretically and empirically sound in that it provides intrinsically motivating language instruction that is relevant to the needs of the learner, it may also have increased in popularity for other unfortunate reasons. Many learners and teachers have told me of their boredom in teaching or learning language. The reason: it is just a language class. This infers that language classes are inherently boring — and so we had better use content to spruce

our classes up a bit. Hence, in practice, language as content has a bad reputation, but the theory of the wonder of language suggests that the problem is not with the subject — it is with the methods, techniques, and teachers who have not presented language in ways concurrent with its true wonder. Ask G.K. Chesterton once wrote:

> *There is no such thing on earth as an uninteresting subject; the only thing that can exist is an uninterested person.*[6]

This is why linguists such as Frerichs (1996), for example have advocated the reinvigoration of language taught as content because it is an inherently interesting subject (when taught by a skillful and knowledgeable teacher) and because certain aspects of linguistics can be very helpful to language learners.

The Wonder and the Future of Applied Linguistics

Besides its many classroom applications, language-wonder raises a number of questions that may be narrowed down into testable hypotheses in linguistics. Specifically, interested linguists need to ask: are there linguistic evidences that point to wondrous and non-physical aspects of mental or linguistic events? Moreover, since the existence of language-wonder frustrates a purely physicalistic view language, it raises other questions. If some aspects of mental and linguistic events are non-physical and thus cannot be the products of purely physical processes, then what operations are left? Surely, there is at least one other option, the option that Aitchison (1996) and Pinker (1994) and many others attempt to refute, and at least according to Pinker is the only other option. This is the theory of intelligent design — the idea that a higher intelligence, God — or something else created humanity with its language capacity.

This idea raises many serious questions, not just for the naturalist, but also for the theist, and even the serious thinking Christian apologist. For me, belief in the Creator is a presupposition which I take by childlike faith and which I may choose to defend with a rigorous philosophical argument. However, when it comes to academic disciplines, faith is often considered out-of-bounds, again not just by naturalists, but by people of religious faith as well. Moreover, when it comes to looking for pointers to intelligent design from evidences in empirical data — such as data from linguists, that

is also out-of-bounds — especially for the naturalist, but also for many a theist and Christian apologist.

Answering each of these concerns is the subject of many books and scholarly articles, so I will answer them briefly here and refer the reader to sources that expertly demonstrate the growing validity of a design oriented approach to scientific disciplines, including linguistics. First of all, regarding the relation of faith to academic disciplines, George Marsden (1997) deftly demonstrates the viability and aptness of such faith-informed scholarship in his book *The Outrageous Idea of Christian Scholarship,* published by Oxford University Press. Gill (1997) has also edited a noteworthy scholarly work on this subject, and Inagaki (1996) discussed the relationship between religion, science, and education in an article in a previous edition of this journal.

If there is a place in the academy for faith-informed scholarship as Marsden et al so lucidly indicate, what about aspects of this scholarship that attempt to point to intelligent design from the natural order? For the naturalist and for many a theist as well, this may amount to a kind of academic treason — and in fact university level academics have been taken to court for attempting to practice such faith-informed scholarship. See Johnson (1995). Basically, questions of intelligent design are demarcated as non-science by the accepted philosophy of science of the day. However, there is a growing body of literature in philosophy of science that demonstrates that a total prescinding from questions of intelligent design can be very, as Stephen C. Meyer puts it intellectually and theoretically limiting (1994, 101).

Meyer, who did his masters and doctoral work in the philosophy and history of science at Cambridge, exemplifies the crisp and rigorous thinking that may help re-earn design oriented science a more widely accepted place in the broader academy. His seminal article (1994) “The Methodological Equivalence of Design and Descent” is clear, concise, and powerfully cogent, and he is currently working on a book that will offer a rigorous reformulation of the design argument for a scientific audience. Moreover, UC Berkeley law professor Phillip Johnsons work (1993, 1995) puts the debate about design-science in its proper place — avoiding secondary side issues — and dealing with the core philosophical problems. Suffice it to say that there exists

significant philosophical underpinnings for the linguist to approach questions of intelligent design from within his discipline in order to present his findings for the benefit and critique of the academic community.

Lastly, due to theological considerations, some Christian apologists may conclude that using linguistic evidences as pointers to intelligent design may be inappropriate because this would be approaching the issue in a backwards manner. According to presuppositionalist apologetics, the starting point is God — not nature, "so only by the total surrender to the presupposition of God can the non-Christian see the merits of the Christian case" (McGrath 1992, 38). However, as Oxford theologian Alister McGrath in his critique of van Tillian apologetics points out, this need not be the case. "The error in question is not *making use* of natural knowledge of God, but making *improper* use of such knowledge" (39). McGrath suggests that general revelation (nature and in our case language) may provide a point of contact or pointers to special revelation and to that which alone can provide a full knowledge of God (Scripture and the revelation of God in Jesus Christ). Thus, we have a strong theological and theoretical foundation in McGraths apologetics for searching for suggestive pointers for God's intelligent activity in the realm of nature, especially in language.

With this theoretical background in mind, I would like to issue a call to linguists to create a research agenda and formulate an array of testable research questions that ask what linguistic evidences might point to mental and linguistic events that corroborate with intelligent design. (See the Appendix). The Oller and Omdahl (1994) article seems to be the first to begin this seriously. Such future work must argue from givens—not gaps—in the data so that as Meyer (1994, 97) puts it:

> Intelligent design can be offered, therefore, as a necessary or best causal explanation only when naturalistic processes seem incapable of producing the *explanandum* effect, and when intelligence is known to be capable of producing it and thought to be more likely to have produced it.

That is, as Bradley and Thaxton (1994) suggest, such research must theorize antecedent intelligent activity not because of what we do not know about language, *but*

because of what we do know about it. The development of such a body of research may not provide overwhelming proof for the miraculous nature of language. However, it will produce a set of theories and research data that posses an initial modest cogency, and if successful, such research may exhibit a strongly competitive explanatory power when compared with rival naturalistic theories about the grounding of human language.

Conclusion

In conclusion, I have discussed the wondrous nature of human language: how it differs radically from other species' communicative behaviors, how it seems exactly analogous to the biogenetic language of DNA, and how language enables us to bridge the abyss between mind and matter. I have contended that non-physical mental events such as reasons, theories, intentions, and values demonstrate that the mind and its language cannot be explained in any purely physicalistic manner. Hence, I have concluded that the following should be considered as a valid and reasonable hypothesis for the grounding of language: i.e., language and the mind may be best understood and explained in terms of wonder — as events that cannot be reduced to pure materiality. In other words, the minds language may be best seen as something sublime and seemingly verging on the preternatural. Thus, the basis of the human language capacity and its inherent capability to bridge the abyss between mind and matter may be best explained in categories that transcend matter and materiality.

From these theoretical implications, we can derive practical applications for pedagogy, mainly that a sense of wonder in language teaching can be enhanced or recovered through wonder-concurrent content-based instruction (including language as content) and through direct and indirect instruction in the marvel of language. Moreover, our understanding of the wondrous nature of language will inform our view of learners and the language we use with them — as we realize that words and word-using-people are not merely ordinary elements in the language teaching matrix — but rather extraordinary. Therefore they are worthy of extraordinary esteem, treatment, and consideration. Lastly, there is room in applied and psycholinguistics for research that asks questions about the ultimate grounding of language. Such a research approach (demonstrated by Oller and Omdahl) need not shun questions of intelligent

design, (see the Appendix), especially as the theoretical bases for such an approach become highly articulated. If such research projects prove successful, they will produce an expanding body of empirical data — based on givens and not gaps in the information base which point to the existence of an Intelligent Designer, whom we may also describe as the Author of the language of life (DNA) and thus the Writer of the code of the human language capacity. Thus, as this paper has tried to demonstrated to a certain degree, the marvel of language and mind not only helps increase our appreciation and respect for human language, it also inspires greater esteem for human learners — as well as grants a deepened awe for the Designer of such an exquisite phenomenon.

Appendix: Potential Research Areas on Language Wonder

Introduction

In issuing a call to linguists to create a research agenda and formulate an array of testable research questions that ask what linguistic evidences might corroborate with intelligent design, I am admitting that this is almost a wholly un-researched area. Besides this, such a research program is still lacking a broad and fully sound theoretical framework. Thus, awaiting the philosophers such as Meyer (1994) to develop the setting further, and realizing the tentativeness and newness of such questions, and deeply aware that I am more teacher than linguistic researcher, I offer the following ideas as a brainstorm on what areas of linguistic research might prove successful in a design-oriented research agenda. I hope that linguists in favor of and against such an approach will critique this brainstorm and suggest what might be added or deleted from it. It is my conviction that such a collaborative effort will be the best way to advance (or terminate if appropriate) a linguistic research agenda searching for intelligent design.

Biogenetic and Human Language

Oller and Omdahl's (1994) work on the comparison between DNA and human language is a good place to start. Is the comparison between DNA and language valid? What are the problems with it? How do linguists and biochemists of differing persuasions view and critique Oller and Omdahls conclusions? What empirical and statistical research can be done to test their conclusions? What are the arguments for and against the idea that DNA and language seem to require intelligent design? Are Oller Omdahl speaking from givens or gaps in the data? What future research agenda do their conclusions infer?

Design Features in Language

One of the key features of human language is creativity — the ability to produce an infinite amount of novel sentences. This creativity is based on the duality of language the way meaningless elements of language at one level (sounds and letters)

combine to form meaningful units (words) at another level (Widdowson 1996, 127). In what ways might the duality and creativity of language point to intelligent design? Are human linguistic systems built and combined in such a way that they seem to be irreducibly complex like Behe (1996) suggests about cellular systems? Perhaps these questions could be specifically researched in three areas. First, do the combinations of phonemes in a given language point to irreducible complexity? Second, do the combinations of morphemes in a given language point to irreducible complexity? Third, do the combinations of words in syntax in a given language point to irreducible complexity? Thus, perhaps it is possible to research design questions about at the phonemic, morphological, and syntactical levels of language.

Information and Probability Theory

I know practically nothing about these areas, so perhaps that qualifies me to ask some questions. Does the complexity of language at various levels (phonemic, morphological, and syntactical) point to characteristics that defy laws of probability? What are the numerical chances that purely physical processes could account for the complexity of language at these various levels? Does such complexity require intelligent design or are there better physicalistic explanations? How does probability theory in general inform design-science and in specific design-linguistics?

Displacement from Time and Space

One of the distinguishing features of human language is that it allows users to communicate about ideas removed from time and space. Is displacement psychologically and linguistically real? If displacement and reference to the unreal is real, then how can it be attributed to physicality in the mind? What linguistic aspects of displacement can be analyzed and attributed to physical causes in the brain? Are there any aspects of linguistically analyzed displacement that avoid being reduced to mere physicality? Are there any aspects of linguistically analyzed displacement that point to intelligent design?

The Emperor's New Mind

World-renowned Physicist, Roger Penrose (1989) argues that artificial intelligence will never duplicate the minds operations, and he claims that something beyond the hardware components of the mind (neurons and synapses) are needed to explain the minds functions. Although Penrose may be searching for a wholly physicalistic cause, perhaps in quantum mechanics, he has still raised problems for physicalists. Are there any aspects of Penrose's data that might lend themselves well to an empirical search for something extra-physical in the mind? Do all the characteristics of the mind behave in physical ways, or do some defy the laws of physics? Could any of Penrose's findings be researched within linguistics or neuroscience in such a way that they might yield empirical pointers to characteristics that would be best explained by intelligent design?

Language, Anthropic Principles, and Extra-dimensionality

Astrophysicist, Hugh Ross, (1993) discusses the just-rightness of the universe in that there are numerous, exquisite, finely-tuned, astrophysical parameters that have been discovered to be necessary for the existence of life. These parameters called "anthropic principles" have moved many an astrophysicist to consider intelligent design because of how their fine tuning seem to require intelligence. For DNA, language, and intelligence, are there any such parameters or anthropic principles? Can they be researched? What is the relationship, if any, between anthropic principles, language and mind, and intelligent design? In another work, Ross (1996) discusses scientific evidence for the extra-dimensionality of the cosmos, and one of the issues he raises is the extra-dimensional capacities of humans in their use of language. How does research into extra-dimensionality relate to linguistics and the potentially supra-physical aspects of language? As scientists have provided widely accepted theory and research on the extra-dimensionality of the cosmos, can it be applied to language? If so, how?

The Origin of Human Language

Up to this point, in this paper I have not discussed questions about the origin of language, and until recently this topic has been considered "a disreputable study"

(Aitchison 1996, 15). However, there seems to be a new upsurge of interest and subsequent acceptability in the subject as evidenced by Oxford Linguist Jean Aitchison's (1996) work on entitled: *"The Seeds of Speech: Language Origin and Evolution."* The book is an easy read (partially due to the authors clarity of style), and it contains a 22 page bibliography. Thus, it contains a wealth of information for a person interested in looking at it from a design perspective rather than a descent perspective. Here are some questions that a researcher from the design perspective might ask in looking at Aitchisons work in specific as well as the topic of the origin of language in general. How does the work of Behe (1996), Denton (1986), Yockey (1992), Johnson, (1993, 1995), Moreland (1994) and others inform and critique accepted conclusions of origin of language research? From the design perspective, what aspects of the current understanding of the origin of language are cogent and acceptable? What serious problems arise in the evolution of language perspective when critiqued by an informed design perspective? What cogent alternative theories to the origin and evolution of language might come from the design perspective?

Conclusion

Because I am a novice or less than a novice in some of these areas, some of these questions may be inane. If so, then they have served their purpose as a part of a free-thinking brainstorm, and they may also stimulate rewarding thinking along other lines. In the end, hopefully some of these questions will lead to some concrete research programs that will help us better answer the question from an applied or psycholinguistics perspective as to whether or not language is simply a physical entity or something else — that is non-physical and saliently points to intelligent design.

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Endnotes

1 The Book of Proverbs, Chapter 18, verse 21. The Holy Bible: New International Version

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〔日本語要約〕

言語－驚異：理論，教授法，そして研究

ジョセフ・ポーシャック

人間の言語はこの自然界において最もありふれた存在であると同時に，多くの驚くべき特徴を有する。それは動物の伝達体系と根本的に異なり，その複雑性において匹敵するのは遺伝発生的なＤＮＡの言語のみである。また，それは人間の精神と物質の間に存在する計り知れない深淵を越えることを可能とさせる。さらに，言語と理性，概念や価値といった精神の能力は，純粋な物理的範疇に適合せず挑むかのように思われる。これらの言語についての事実および理論的側面は語学教授法に対して，少なくとも次の３分野に豊富な情報を提供する。1)言語の力（言語の真意）に対する我々の認識と責任，2)語学学習者の概念，3)語学を教授する際に用いる内容に対する考え方，そして，最後に言語－驚異の理論は応用言語学と真理言語学にこれからの研究課題を示唆し，人間の言語に固有の，いわゆる構成特徴に新たな光を投げかけるであろう。

（訳：木戸　晶）

[Abstract in English]

Language-Wonder: to Christian Philosophy

J. W. Poulshock

While human language is a most common entity in the natural world, it possesses many wondrous characteristics. It is radically different from nonhuman communication systems; it is only rivaled in complexity by the biogenetic language of DNA, and it enables humans to cross a seemingly abysmal gulf between mind and matter. Moreover, some representational powers of language and mind, such as reason, intentions, and values, seem to frustrate purely materialistic categories. These factual and theoretical aspects of language richly inform language teaching pedagogy in at least three areas: (1) in our recognition and stewardship of the force of language, (2) in our concept of the language learner, and (3) in our view of the content used in the language classroom. Lastly, the theory of language-wonder suggests a potential research agenda in applied and psycholinguistics that may shed new light on the so-called design features inherent only in human language.